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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,846	12/16/2003	Petrus Marinus Christianus Maria Van Den Biggelaar	081468-0304891	3170
909	7590	07/21/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			NGUYEN, HUNG	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,846

Applicant(s)

VAN DEN BIGGELAAR ET AL.

Examiner

Hung Henry V. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/12/04; 5/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 2a-2d should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, the limitation of "an absolute value of at least one of a fourth and a higher derivative to time of the position of the motion *being limited to less than a maximal value*" is vague and indefinite. The claim does not "circumscribe" a particular area but only establishes, at best, one end point by reciting that "limited to less than a maximal value" but the claim does not "close the circle", i.e. "circumscribe" the particular area by establishing what the "maximum

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value” is. Therefore, the “maximum value” of derivative to time of the position of the motion/jerk profile, as claimed can not be determined and not clearly understood.

As to claim 18, the recitation of “an absolute value of at least one of a fourth and a higher derivative to time of the position of the motion being limited to less than a maximal value” is vague and indefinite for the same reason as set forth above.

As to claims 25 and 29, the recitation of “at least one of a fourth and a higher derivative to time of the set point signal being limited to a maximum” is vague and indefinite for the same reasons as set forth above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. As the best the claimed subject matters are understood (see rejection under 35 U.S.C. 112, second paragraph, supra). Claims are anticipated by references.

6. Claims 1-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (U.S.Pat. 6,809,798) in view of McConnell et al (U.S.Pat. 6,294,891).

With respect to claims 1-17, 30-42, Fujita discloses a lithographic projection apparatus, corresponding method, and a corresponding computer program, comprising substantially all of the limitations of the instant claims such as: a supporting structure (6) for supporting a patterning structure (R); a substrate table (12) for holding a substrate (W); a projection optical system (9)

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for projecting a predetermined pattern formed on the patterning structure onto the substrate an actuator configured to move at least one of the support structure and the substrate table and a controller configured to provide a motion signal to the actuator, the motion signal controlling the actuator to produce a motion of the substrate (see col.3, line 49-52) and wherein the motion signal/set point data comprises a motion signal/set point data for a desired position of the at least one of the support structure and the substrate table (see figure 2). Fujita further teaches a trajectory planner (16,17) for generating the motion signal by constructing a function of time defining consecutive time intervals with a substantially constant function value and wherein the constant function value in each consecutive time interval is either a maximal positive value, a maximal negative value of the substantially same absolute value as the maximal positive value of zero (see figures 3b,d,f) and wherein intermediate results of integrating of integrating the constant function of time are determined, including a jerk profile, an acceleration profile, a velocity profile, and a position profile, and the motion profile corresponding to the motion signal, as respective integrals of the constructed function of time (for example, see col.7, lines 11-17, equations 1-8). Fujita teaches the motion of the substrate table is in a stepping direction and /or in scanning direction (see col.11, lines 4-16). Fujita does not expressly disclose limiting the fourth derivative to time of a motion/set point signal by an absolute value being less than a maximal value or boundary. Also, Fujita does not expressly disclose the motion signal controlling the actuator to produce an acceleration having a high at least one of a third...and the higher derivative to time of the position of the motion". McConnell et al discloses a system for reducing unwanted vibration in motion system and having a controller for providing a motion signal to the actuator of the motion system, an absolute value of at least one of a fourth and

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higher derivative to time of the position of the motion being limited to less than a maximal value/a boundary (see col.29, lines 17-37 and claim 8, see figure 38D) and a command input function using the acceleration profile (see col.28, lines 7-62). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Fujita and McConnell to obtain the invention as specified in the instant claims. It would have obvious to a skilled artisan to provide a motion signal as taught by McConnell for controlling the actuator of Fujita to limit the fourth derivative or higher derivative to time of a motion/set point signal by a finite maximum or boundary for the purpose of reducing the vibration of in the motion system and thus improving the throughput of the lithographic device.

With respect to claims 18-24, 25-29 and 43-52, the computer program product, the device manufacturing method are seen to be inherent teachings in existence of the above apparatuses (see col.8, lines 25-29 of McConnell).

Prior Art Made of Record

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Quaschner et al (U.S.Pat. 6,580,245) is cited for its teaching of controlling the jerk limited velocity of a moving element.

Cullen (US 2004/0135534 A1) is cited for its teachings of a control system for a motor in which a control signal is applied that causes the motor to change position over time.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hung Henry V Nguyen
Primary Examiner
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hvn
7/8/05